

SA ISSN 0038-223X

Supplement to the Journal of the South African Institute of Mining and Metallurgy, March 1983

INDEX

TO THE

JOURNAL OF THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY

VOLUME 82
JANUARY — DECEMBER 1982

PUBLISHED BY THE INSTITUTE, KELVIN HOUSE, 2 HOLLARD STREET, JOHANNESBURG.
and Printed by Northern Cape Printers, Kimberley.



THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY

OFFICE BEARERS AND COUNCIL FOR THE 1981-1982 SESSION

Honorary President

L. W. P. van den Bosch
President, Chamber of Mines of South Africa

Honorary Vice-Presidents

The Honourable F. W. de Klerk
Minister of Mineral and Energy Affairs
The Honourable W. A. Cruywagen
Administrator, Transvaal Province
The Honourable L. J. Botha
Administrator, Orange Free State Province
The Honourable E. Louw
Administrator, Cape Province
The Honourable J. C. G. Botha
Administrator, Natal Province
V. C. Barnes, Government Mining Engineer

President

G. Y. Nisbet

Immediate Past President

Dr P. R. Jochens

Vice-Presidents

Prof. A. N. Brown
Prof. R. P. King

Honorary Treasurer

Prof. D. G. Krige

Ordinary Members of Council

| | |
|------------------|------------------|
| B. C. Alberts | C. G. Knobbs |
| J. D. Austin | Dr B. K. Loveday |
| P. T. Fewell | Dr J. Lurie |
| C. E. Fivaz | C. S. Macphail |
| J. J. Geldenhuys | D. G. Malan |
| Dr A. K. Haines | J. C. Mostert |
| P. N. Harris | G. C. Thompson] |
| H. E. James | Dr H. Wagner |

Branch Chairmen

K. F. W. Eicke, Witbank/Middelburg Branch
B. Rohrmann, OFS/Klerksdorp Branch
G. P. Pienaar, Materials Engineering Specialist Division

Past Presidents serving on Council

| | |
|---------------------|-----------------------|
| Dr M. G. Atmore | Dr R. E. Robinson |
| H. Britten | Dr M. D. G. Salamon |
| Prof. D. D. Howat | P. W. J. van Rensburg |
| Dr J. P. Hugo | D. A. Viljoen |
| D. G. Maxwell | P. A. von Wielligh |
| Prof. R. P. Plewman | |

Corresponding Members of Council

United Kingdom: R. H. McWilliam, C. T. Shaw
Australasia: G. A. Mackay
Canada: Prof. B. W. MacKenzie
U.S.A.: Dr H. M. Wells, Dr J. M. Rendu
Zimbabwe: Prof. K. T. Viewing

Federation of Societies of Professional Engineers

Representatives: D. A. Viljoen, Prof. A. N. Brown
Alternates: H. E. James, J. D. Austin

Council of Mining and Metallurgical Institutions

G. J. Mortimer

The Associated Scientific and Technical Societies of South Africa — Controlling Executive

Representatives: G. Y. Nisbet and Dr P. R. Jochens
Alternates: Prof. A. N. Brown and Prof. R. P. King

Honorary Legal Advisers

Messrs Van Hulsteyn, Duthie & Saner

Auditors

Messrs Alex. Aiken & Carter

THE PRESIDENT 1981-1982 MR G. Y. NISBET



PAST PRESIDENTS

| | |
|------------------------------------|-----------------------------------|
| *W. Bettel (1894-1895) | *E. H. A. Joseph (1939-1940) |
| *A. F. Crosse (1895-1896) | *J. H. Dobson (1940-1941) |
| *W. R. Feldtmann (1896-1897) | *Theo Meyer (1941-1942) |
| *C. Butters (1897-1898) | *John V. Muller (1942-1943) |
| *J. Loevy (1898-1899) | *C. Biccard Jeppe (1943-1944) |
| *J. R. Williams (1899-1903) | *P. J. Louis Bok (1944-1945) |
| *S. H. Pearce (1903-1904) | *J. T. McIntyre (1945-1946) |
| *W. A. Caldecott (1904-1905) | *M. Falcon (1946-1947) |
| *W. Cullen (1905-1906) | *A. Clemes (1947-1948) |
| *E. H. Johnson (1906-1907) | F. G. Hill (1948-1949) |
| *J. Yates (1907-1908) | *O. A. E. Jackson (1949-1950) |
| *R. G. Bevington (1909-1909) | *W. E. Gooday (1950-1951) |
| *A. McA. Johnston (1909-1910) | C. J. Irving (1951-1952) |
| *J. Moir (1910-1911) | *D. D. Stitt (1952-1953) |
| *C. B. Saner (1911-1912) | *M. C. G. Meyer (1953-1954) |
| *W. R. Dowling (1912-1913) | L. A. Bushell (1954-1955) |
| *A. Richardson (1913-1914) | H. Britten (1955-1956) |
| *G. H. Stanley (1914-1915) | Wm. Bleloch (1956-1957) |
| *J. E. Thomas (1915-1916) | *H. Simon (1957-1958) |
| *J. A. Wilkinson (1916-1917) | *M. Barca (1958-1959) |
| *G. Hildick-Smith (1917-1918) | R. J. Adamson (1959-1960) |
| *H. S. Meyer (1918-1919) | *W. S. Findlay (1960-1961) |
| *J. Gray (1919-1920) | D. G. Maxwell (1961-1962) |
| *J. Chilton (1920-1921) | J. de V. Lambrechts (1962-1963) |
| *F. Wartenweiler (1921-1922) | J. F. Reid (1963-1964) |
| *G. A. Watermeyer (1922-1923) | D. M. Jamieson (1964-1965) |
| *F. W. Watson (1923-1924) | H. E. Cross (1965-1966) |
| *C. J. Gray (1924-1925) | *D. Gordon Jones (1966-1967) |
| *H. A. White (1925-1926) | P. Lambooy (1967-1968) |
| *H. R. Adam (1926-1927) | R. C. J. Goode (1968-1969) |
| *Sir R. N. Kotze (1927-1928) | J. K. E. Douglas (1969-1970) |
| *J. A. Woodburn (1928-1929) | V. C. Robinson (1970-1971) |
| *H. Pirow (1929-1930) | D. D. Howat (1971-1972) |
| *J. Henderson (1930-1931) | J. P. Hugo (1972-1973) |
| *A. King (1931-1932) | P. W. J. van Rensburg (1973-1974) |
| *V. Nimmo-Dewar (1932-1933) | R. P. Plewman (1974-1975) |
| *P. N. Lategan (1933-1934) | R. E. Robinson (1975-1976) |
| *E. C. Ranson (1934-1935) | M. D. G. Salamon (1976-1977) |
| *R. A. Flugge-De-Smidt (1935-1936) | P. A. von Wielligh (1977-1978) |
| *T. K. Prentice (1936-1937) | G. Atmore (1978-1979) |
| *R. S. G. Stokes (1937-1938) | D. A. Viljoen (1979-1980) |
| *P. E. Hall (1938-1939) | P. R. Jochens (1980-1981) |

*Deceased

Secretaries

Associated Scientific and Technical Societies of South Africa
Kelvin House, 2 Holland Street, Johannesburg.
Telegraphic Address: Perspicax
P.O. Box 61019 Telephone 832-2177
Marshalltown, Tvl.
2107

Editor: Dr H. W. Glen

This Journal is published with financial assistance from the Department of National Education.

CONTENTS OF VOLUME 82, 1982

| | <i>Page</i> |
|-----------------------------------|-------------|
| Journal No. 1 — January | 1 |
| 2 — February | 17 |
| 3 — March | 53 |
| 4 — April | 97 |
| 5 — May | 121 |
| 6 — June | 149 |
| 7 — July | 177 |
| 8 — August | 205 |
| 9 — September | 237 |
| 10 — October | 277 |
| 11 — November | 309 |
| 12 — December | 341 |

PAPERS AND NOTES READ BEFORE THE INSTITUTE

| | Page |
|--|------|
| An analogue system for the early detection of fires in gold mines, by P. S. Turner | 1 |
| The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | 6 |
| Personeelbestuur in die mynboubedryf, deur F. C. Kruger en F. S. A. de Frey | 12 |
| The heavy-minerals plant at Palabora Mining Company – a low-grade, high-tonnage gravity concentrator, by R. C. M. van der Spuy | 17 |
| The mining of low-grade areas at Stilfontein Gold Mine, by V. J. Solomon and H. P. Coetzee | 30 |
| Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Koursaris | 38 |
| The application and design of wet-gravity circuits in the South African minerals industry, by A. B. Holland-Batt, G. F. Balder-son, and M. S. Cross | 53 |
| Calculations of grade and tonnage for two co-products from a projected South African gold mine, by E. J. Magri | 71 |
| The dissolution of gold from roasted pyrite concentrates, by A. O. Filmer | 90 |
| The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. M. Stönnner and P. Wiesner | 97 |
| Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |
| The gravity recovery of cassiterite, by L. M. Falcon | 112 |
| Spotlight on Dr Peter Laxen and carbon-in-pulp | 118 |
| Some considerations in the use of gravity concentration for the recovery of gold, by B. K. Loveday and J. E. Forbes | 121 |
| Some results of laboratory experiments on batch centrifugal ball milling, by D. I. Hoyer and M. F. Dawson | 125 |
| Prehistoric mining in South Africa, and Iron Age copper mines in the Dwaarsberg, Transvaal, by R. J. Mason, with addendum by T. C. Partridge | 134 |
| Spotlight on the production of amines in South Africa, by K. Barlow and J. M. W. Mackenzie | 146 |
| A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton and G. K. Schymura | 149 |
| Research management by objectives, by L. Alberts | 157 |
| Project control – an overview, by R. J. Knott and E. R. Davis | 160 |
| Spotlight on coal-based direct reduction at Iscor, by S. Visagie | 165 |
| Kollig op oppervlaktebedekking van metaalonderdele, deur A. P. van Wyk | 168 |
| The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | 177 |
| Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom .. | 193 |
| Spotlight on the 12th CMMI Congress, by Charles Macphail | 200 |
| A review of the deposits and beneficiation of lower-grade chromite, by Ralph H. Nafziger | 205 |
| Reichert cones for Witwatersrand gold ores, by R. Guest | 227 |
| Spotlight on new office-bearers of the Chamber of Mines | 234 |
| Presidential Address: The future supply of engineers for the mining industry, by A. N. Brown | 257 |
| Contribution to the mechanism of core discing, by T. R. Stacey | 269 |
| Support in shallow mines using horizontally reinforced systems, by J. A. Hahn, G. E. Blight, and L. Dison | 277 |
| A contactor for liquid-liquid extraction from slurries, by H. W. Byerlee | 291 |
| Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | 303 |
| Spotlight on the SAIMM coat-of-arms, by R. P. Plewman | 308 |
| Some fundamental aspects of the use of disc cutters in hard-rock excavation, by D. F. Howarth and F. F. Roxborough | 309 |
| The prediction of air temperatures in intake haulages in mines, by K. R. Vost | 316 |
| Project management on a reimbursable, plus-fee contract, by F. van Heerden | 329 |
| The planning and establishment of the Grootegeluk Coal Mine, by B. C. Alberts | 341 |
| The establishment of infrastructure for the Grootegeluk Coal Mine, by E. F. W. Buermann | 353 |
| The planning and establishment of the coal-beneficiation plant at Grootegeluk, by J. Gilliland | 356 |
| Project planning and progress control for the Grootegeluk Coal Project, by A. P. L. Kotzé | 365 |
| Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Coreejas .. | 370 |
| Spotlight on solid-liquid separation, by John Freer | 377 |

AUTHOR AND SUBJECT INDEX

| | Page |
|---|------|
| A | |
| Agrawal, R. D. | |
| jt author: Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |
| Alberts, B. C. | |
| author: The planning and establishment of the Grootegeluk Coal Mine | 341 |
| Alberts, L. | |
| author: Research management by objectives.. . . . | 157 |
| AMINES | |
| Spotlight on the production of amines in South Africa, by K. Barlow and J. M. W. Mackenzie | 146 |
| ANCIENT mining <i>see</i> Mining, Ancient | |
| ANNUAL General Meeting <i>see</i> Proceedings at General Meetings | |
| AWARDS | |
| Brigadier Stokes Memorial Award to Dr Francis George Hill | 237 |
| Percy Fox Foundation Award to Dr Peter Laxen | 118 |
| Institute's Silver Medal to Prof. A. Ball, and B. E. Protheroe | 239 |
| Institute's Silver Medal to Dr A. A. Hejja | 239 |
| Certificates of Merit to Dr C. Allen, Dr H. M. Friede, and Dr A. Koursaris | 239 |
| Student prizes to J. Kriek, J. M. Benson, P. Dean, and T. de Lange | 240 |
| Gold Medal of the Suid-Afrikaanse Akademie vir Wetenskap en Kuns to Prof. Daniel Gerhardus Krige | 290 |
| B | |
| Balderson, G. F. | |
| jt author: The application and design of wet-gravity circuits in the South African minerals industry, by A. B. Holland-Batt, G. F. Balderson, and M. S. Cross | 53 |
| disc.: Reichert cones for Witwatersrand gold ores, by R. Guest | 376 |
| Barlow, K. | |
| jt author: Spotlight on the production of amines in South Africa, by K. Barlow and J. M. W. Mackenzie | 146 |
| Blight, G. E. | |
| jt author: Support in shallow mines using horizontally reinforced systems, by J. A. Hahn, G. E. Blight, and L. Dison | 277 |
| Bradley, A. A. | |
| jt author: A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| Brown, A. N. | |
| Presidential Address: The future supply of engineers for the mining industry | 257 |
| Browner, S. J. | |
| jt author: The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | 6 |
| Buermann, E. F. W. | |
| author: The establishment of infrastructure for the Grootegeluk Coal Mine | 353 |
| Byerlee, H. W. | |
| author: A contactor for liquid-liquid extraction from slurries | 291 |
| C | |
| CASSITERITE | |
| The gravity recovery of cassiterite, by L. M. Falcon | 112 |
| Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| CEMENTATION | |
| Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |

| | Page |
|---|------|
| CHAMBER of Mines of South Africa | |
| Spotlight on new office-bearers of the Chamber of Mines | 234 |
| CHEMWES | |
| The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | 177 |
| CHROMITE | |
| A review of the deposits and beneficiation of lower-grade chromite, by Ralph H. Nafziger | 205 |
| COAL | |
| Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Corejes | 370 |
| The establishment of infrastructure for the Grootegeluk Coal Mine, by E. F. W. Buermann | 353 |
| The planning and establishment of the coal-beneficiation plant at Grootegeluk, by J. Gilliland | 356 |
| The planning and establishment of the Grootegeluk Coal Mine, by B. C. Alberts | 341 |
| Project planning and progress control for the Grootegeluk Coal Project, by A. P. L. Kotzé | 365 |
| COBALT | |
| Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | 303 |
| Coetzee, H. P. | |
| jt author: The mining of low-grade areas at Stilfontein Gold Mine, by V. J. Solomon and H. P. Coetzee | 30 |
| COLLOQUIA | |
| Kollig op oppervlaktebedekking van metaalonderdele, deur A. P. van Wyk | 168 |
| Spotlight on solid-liquid separation, by John Freer | 377 |
| COMMINUTION | |
| A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| Some results of laboratory experiments on batch centrifugal ball milling, by D. I. Hoyer and M. F. Dawson | 125 |
| COMPUTERS - Simulation programmes | |
| The application and design of wet-gravity circuits in the South African minerals industry, by A. B. Holland-Batt, G. F. Balderson, and M. S. Cross | 53 |
| CONCENTRATORS | |
| The application and design of wet-gravity circuits in the South African minerals industry, by A. B. Holland-Batt, G. F. Balderson, and M. S. Cross | 53 |
| The gravity recovery of cassiterite, by L. M. Falcon | 112 |
| The heavy-minerals plant at Palabora Mining Company - a low-grade, high-tonnage gravity concentrator, by R. C. M. van der Spuy | 17 |
| Reichert cones for Witwatersrand gold ores, by R. Guest | 227 |
| Contribution by G. L. C. Young p. 233; Disc. p. 376 | |
| Some considerations in the use of gravity concentration for the recovery of gold, by B. K. Loveday and J. E. Forbes | 121 |
| CONTACTORS | |
| A contactor for liquid-liquid extraction from slurries, by H. W. Byerlee | 291 |
| COPPER | |
| Prehistoric mining in South Africa, and Iron Age copper mines in the Dwaarsberg Transvaal, by R. J. Mason, with addendum by T. C. Partridge | 134 |
| Corrigenda p. 199. | |
| Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |

| | Page |
|--|------|
| Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | 303 |
| CORE discing | |
| Contributions to the mechanism of core discing, by T. R. Stacey | 269 |
| Coreejes, A. G. R. | |
| jt author: Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Coreejes | 370 |
| COSTS | |
| Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Coreejes | 370 |
| Project planning and progress control for the Grootegeluk Coal Project, by A. P. L. Kotzé | 365 |
| COUNCIL of Mining and Metallurgical Institutions | |
| Spotlight on the 12th CMMI Congress, by Charles Macphail | 200 |
| Craig, W. M. | |
| jt author: The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | 177 |
| Cross, M. S. | |
| jt author: The application and design of wet-gravity circuits in the South African minerals industry, by A. B. Holland-Batt, G. F. Balderson, and M. S. Cross | 53 |
| CUTTING tools | |
| Some fundamental aspects of the use of disc cutters in hard-rock excavation, by D. F. Howarth and F. F. Roxborough | 309 |
| D | |
| Davis, E. R. | |
| jt author: Project control - an overview, by R. J. Knott and E. R. Davis | 160 |
| Dawson, M. F. | |
| jt author: Some results of laboratory experiments on batch centrifugal ball milling, by D. I. Hoyer and M. F. Dawson | 125 |
| de Frey, F. S. A. | |
| jt author: Personeelbestuur in die mynboubedryf, deur F. C. Kruger en F. S. A. de Frey | 12 |
| DETECTORS | |
| An analogue system for the early detection of fires in gold mines, by P. S. Turner | 1 |
| Dison, L. | |
| jt author: Support in shallow mines using horizontally reinforced systems, by J. A. Hahn, G. E. Blight, and L. Dison | 277 |
| DISSOLUTION see Solution (chemistry) | |
| Dohm, C. E. | |
| jt author: The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | 6 |
| E | |
| ENGINEERS | |
| The future supply of engineers for the mining industry: Presidential Address by A. N. Brown | 257 |
| ENVIRONMENT | |
| The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom | 193 |
| EXTRACTION PROCESSES | |
| A contactor for liquid-liquid extraction from slurries, by H. W. Byerlee | 291 |
| The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. M. Stöner and P. Wiesner | 97 |
| Spotlight on Dr Peter Laxen and carbon-in-pulp | 118 |
| Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | 303 |
| F | |
| Falcon, L. M. | |
| author: The gravity recovery of cassiterite | 112 |
| Fenton, C. T. | |
| Spotlight on new office-bearers of the Chamber of Mines | 234 |

| | Page |
|---|------|
| Ferreira, G. | |
| jt author: Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Coreejes | 370 |
| Filmer, A. O. | |
| author: The dissolution of gold from roasted pyrite concentrates | 90 |
| FIRES | |
| An analogue system for the early detection of fires in gold mines, by P. S. Turner | 1 |
| Forbes, J. E. | |
| jt author: Some considerations in the use of gravity concentration for the recovery of gold, by B. K. Loveday and J. E. Forbes | 121 |
| Freer, J. | |
| author: Spotlight on solid-liquid separation | 377 |
| Friede, H. M. | |
| jt author: Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Kour-saris | 38 |
| G | |
| Gilliland, J. | |
| author: The planning and establishment of the coal-beneficiation plant at Grootegeluk | 356 |
| GOLD | |
| The dissolution of gold from roasted pyrite concentrates, by A. O. Filmer | 90 |
| The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | 6 |
| Reichert cones for Witwatersrand gold ores, by R. Guest | 227 |
| Contribution by G. L. C. Young p. 233; Disc. p. 376 | |
| Some considerations in the use of gravity concentration for the recovery of gold, by B. K. Loveday and J. E. Forbes | 121 |
| GOLD mines and mining | |
| An analogue system for the early detection of fires in gold mines, by P. S. Turner | 1 |
| Calculations of grade and tonnage for two co-products from a projected South African gold mine, by E. J. Magri | 71 |
| The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom | 193 |
| The mining of low-grade areas at Stilfontein Gold Mine, by V. J. Solomon and H. P. Coetzee | 30 |
| Green, B. R. | |
| jt author: Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | 303 |
| GROOTEDELUK Coal Mine | |
| Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Coreejes | 370 |
| The establishment of infrastructure for the Grootegeluk Coal Mine, by E. F. W. Buermann | 323 |
| The planning and establishment of the coal-beneficiation plant at Grootegeluk, by J. Gilliland | 356 |
| The planning and establishment of the Grootegeluk Coal Mine, by B. C. Alberts | 341 |
| Project planning and progress control for the Grootegeluk Coal Project, by A. P. L. Kotzé | 365 |
| Guest, R. | |
| author: Reichert cones for Witwatersrand gold ores | 227 |
| Contribution by G. L. C. Young p. 233; Disc. p. 376 | |
| H | |
| Hahn, J. A. | |
| jt author: Support in shallow mines using horizontally reinforced systems, by J. A. Hahn, G. E. Blight, and L. Dison | 277 |
| Hancock, R. D. | |
| jt author: Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | 303 |

| | Page |
|---|------|
| Hejja, A. A. jt author: Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Koursaris | 38 |
| Hinde, A. L. jt author: A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| Holland-Batt, A. B. jt author: The application and design of wet-gravity circuits in the South African minerals industry, by A. B. Holland-Batt, G. F. Balderson, and M. S. Cross | 53 |
| Howarth, D. F. jt author: Some fundamental aspects of the use of disc cutters in hard-rock excavation, by D. F. Howarth and F. F. Roxborough | 309 |
| Hoyer, D. I. jt author: Some results of laboratory experiments on batch centrifugal ball milling, by D. I. Hoyer and M. F. Dawson | 125 |

I

| | |
|--|-----|
| IRON | |
| Heavy-medium and gravity separation at Iscor's tinore and iron-ore mines, by H. C. Voges | 186 |
| Spotlight on coal-based direct reduction at Iscor, by S. Visagie | 165 |
| Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |
| IRON AGE | |
| Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Koursaris | 38 |
| Prehistoric mining in South Africa, and Iron Age copper mines in the Dwaarsberg, Transvaal, by R. J. Mason, with addendum by T. C. Partridge .. | 134 |
| ISCOR | |
| Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Corejes | 370 |
| The establishment of infrastructure for the Grootegeluk Coal Mine, by E. F. W. Buermann | 353 |
| Heavy-medium and gravity separation at Iscor's tinore and iron-ore mines, by H. C. Voges | 186 |
| The planning and establishment of the coal-beneficiation plant at Grootegeluk, by J. Gilliland | 356 |
| The planning and establishment of the Grootegeluk Coal Mine, by B. C. Alberts | 341 |
| Project planning and progress control for the Grootegeluk Coal Project, by A. P. L. Kotzé | 365 |
| Spotlight on coal-based direct reduction at Iscor, by S. Visagie | 165 |

K

| | |
|--|-----|
| Kapoor, M. L. | |
| jt author: Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |
| Knott, R. J. | |
| jt author: Project control - an overview, by R. J. Knott and E. R. Davis | 160 |
| Kotzé, A. P. L. | |
| author: Project planning and progress control for the Grootegeluk Coal Project | 365 |
| Koursaris, A. | |
| jt author: Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Koursaris | 38 |
| Kruger, F. C. | |
| jt author: Personeelbestuur in die mynboubedryf, deur F. C. Kruger en F. S. A. de Frey | 12 |

L

| | |
|---|-----|
| Laxen, P. | |
| Spotlight on Dr Peter Laxen and carbon-in-pulp .. | 118 |

| | |
|---|-----|
| Lloyd, P. J. D. | |
| jt author: A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| Loveday, B. K. | |
| jt author: Some considerations in the use of gravity concentration for the recovery of gold, by B. K. Loveday and J. E. Forbes | 121 |

M

| | |
|--|-----|
| McIntosh, A. M. | |
| jt author: The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | 177 |
| Mackenzie, J. M. W. | |
| jt author: Spotlight on the production of amines in South Africa, by K. Barlow and J. M. W. Mackenzie | 146 |
| Macphail, C. | |
| author: Spotlight on the 12th CMMI Congress .. | 200 |
| Magri, E. J. | |
| author: Calculations of grade and tonnage for two co-products from a projected South African gold mine | 71 |
| Malan, W. W. | |
| Spotlight on new office-bearers of the Chamber of Mines | 234 |
| MARGINAL mining | |
| The mining of low-grade areas at Stilfontein Gold Mine, by V. J. Solomon and H. P. Coetzee .. | 30 |
| Mason, R. J. | |
| author: Prehistoric mining in South Africa, and Iron Age copper mines in the Dwaarsberg, Transvaal, by R. J. Mason, with addendum by T. C. Partridge .. | 134 |
| Corrigenda p. 199. | |
| MATHEMATICAL models | |
| Calculations of grade and tonnage for two co-products from a projected South African gold mine, by E. J. Magri | 71 |
| The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. M. Stöner and P. Wiesner | 97 |
| The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | 6 |
| The prediction of air temperatures in intake haulages in mines, by K. R. Vost | 316 |
| Some results of laboratory experiments on batch centrifugal ball milling, by D. I. Hoyer and M. F. Dawson | 125 |
| Theoretical considerations of the cementation of copper with iron, by R. D. Agrawal and M. L. Kapoor | 106 |
| MERCURY | |
| The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom | 193 |
| METAL coating | |
| Kollig op oppervlaktebedekking van metaalonderdele, deur A. P. van Wyk | 168 |
| MILLING see Comminution | |
| MILLS | |
| A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| MINING, Ancient | |
| Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Koursaris | 38 |
| Prehistoric mining in South Africa, and Iron Age copper mines in the Dwaarsberg, Transvaal, by R. J. Mason, with addendum by T. C. Partridge .. | 134 |
| Corrigenda p. 199. | |
| MINING industry | |
| The future supply of engineers for the mining industry: Presidential Address by A. N. Brown .. | 257 |
| MODELS | |
| A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |

| | N | Page |
|---|---|------|
| Nafziger, R. H. | | |
| author: A review of the deposits and beneficiation of lower-grade chromite | | 205 |
| NICKEL | | |
| Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | | 303 |
| Nisbet, G. Y. | | |
| Spotlight on new office-bearers of the Chamber of Mines | | 234 |
| ORE valuation | O | |
| Calculations of grade and tonnage for two co-products from a projected South African gold mine, by E. J. Magri | | 71 |
| P | | |
| PALABORA Mining Company | | |
| The heavy-minerals plant at Palabora Mining Company - a low-grade, high-tonnage gravity concentrator, by R. C. M. van der Spuy | | 17 |
| Partridge, T. C. | | |
| Prehistoric mining in South Africa, and Iron Age copper mines in the Dwaarsberg, Transvaal, by R. J. Mason, with addendum by T. C. Partridge .. | | 134 |
| Corrigenda p. 199. | | |
| PERSONNEL management | | |
| Personeelbestuur in die mynboubedryf, deur F. C. Kruger en F. S. A. de Frey | | 12 |
| PLANT design | | |
| The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | | 177 |
| Plewman, R. P. | | |
| author: Spotlight on the SALMM coat-of-arms .. | | 308 |
| PREHISTORIC mining see Mining, Ancient | | |
| PRESIDENTIAL Address | | |
| Brown, A. N. The future supply of engineers for the mining industry | | 257 |
| PROCEEDINGS at General Meetings | | |
| Annual General Meeting, 18th Aug., 1982 .. . | | 237 |
| PROJECT management | | |
| Capital and cost control systems used in the establishment of the Grootegeluk Coal Mine, by G. Ferreira and A. G. R. Coreejes | | 370 |
| The establishment of infrastructure for the Grootegeluk Coal Mine, by E. F. W. Buermann .. . | | 353 |
| The planning and establishment of the coal-beneficiation plant at Grootegeluk, by J. Gilliland .. . | | 356 |
| The planning and establishment of the Grootegeluk Coal Mine, by B. C. Alberts | | 341 |
| Project control - an overview, by R. J. Knott and E. R. Davis | | 160 |
| Project management on a reimbursable, plus-fee contract, by F. van Heerden | | 329 |
| Project planning and progress control for the Grootegeluk Coal Project, by A. P. L. Kotzé .. . | | 365 |
| PYRITE | | |
| The dissolution of gold from roasted pyrite concentrates, by A. O. Filmer | | 90 |
| R | | |
| REDUCTION | | |
| The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | | 6 |
| Spotlight on coal-based direct reduction at Iscor, by S. Visagie | | 165 |
| REICHERT cones see Concentrators | | |
| RESEARCH | | |
| Research management by objectives, by L. Alberts .. | | 157 |
| RESINS | | |
| Useful resins for the selective extraction of copper, nickel, and cobalt, by B. R. Green and R. D. Hancock | | 303 |
| ROCK cutting | | |
| Some fundamental aspects of the use of disc cutters in hard-rock excavation, by D. F. Howarth and F. F. Roxborough | | 309 |

| | Page |
|---|------|
| ROOIBERG Tin Mine | |
| The gravity recovery of cassiterite, by L. M. Falcon Roxborough, F. F. | 112 |
| jt author: Some fundamental aspects of the use of disc cutters in hard-rock excavation, by D. F. Howarth and F. F. Roxborough | 309 |
| S | |
| Schröder, H. H. E. | |
| jt author: The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom .. | 193 |
| Schymura, G. K. | |
| jt author: A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| SEPARATION | |
| The gravity recovery of cassiterite, by L. M. Falcon Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| Spotlight on solid-liquid separation, by John Freer | 377 |
| SISHEN mine | |
| Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| SLAG | |
| Archaeo-metallurgical studies of iron-smelting slags from prehistoric sites in Southern Africa, by H. M. Friede, A. A. Hejja, and A. Koursaris | 38 |
| SLURRIES | |
| A contactor for liquid-liquid extraction from slurries, by H. W. Byerlee | 291 |
| Solomon, V. J. | |
| jt author: The mining of low-grade areas at Stilfontein Gold Mine, by V. J. Solomon and H. P. Coetzee | 30 |
| SOLUTION (Chemistry) | |
| The dissolution of gold from roasted pyrite concentrates, by A. O. Filmer | 90 |
| SOLVENT extraction see Extraction processes | |
| SOLVENTS | |
| The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. M. Stönnner and P. Wiesner | 97 |
| SOUTE African Institute of Mining and Metallurgy | |
| Spotlight on the SALMM coat-of-arms, by R. P. Plewman | 308 |
| SOUTH African Iron and Steel Industrial Corporation see Iscor | |
| Splaine, M. | |
| jt author: The effect of head grade on recovery efficiency in a gold-reduction plant, by M. Splaine, S. J. Browner, and C. E. Dohm | 6 |
| SPOTLIGHT series | |
| Kollig op oppervlaktebedekking van metaalonderdele, deur A. P. van Wyk | 168 |
| Spotlight on coal-based direct reduction at Iscor, by S. Visagie | 165 |
| Spotlight on Dr Peter Laxen and carbon-in-pulp .. | 118 |
| Spotlight on new office-bearers of the Chamber of Mines | 234 |
| Spotlight on solid-liquid separation, by John Freer .. | 377 |
| Spotlight on the production of amines in South Africa, by K. Barlow and J. M. W. Mackenzie .. | 146 |
| Spotlight on the SALMM coat-of-arms, by R. P. Plewman | 308 |
| Spotlight on the 12th CMMI Congress, by Charles Macphail | 200 |
| Stacey, T. R. | |
| author: Contribution to the mechanism of core dissolving | 269 |
| Stanton, K. H. | |
| jt author: A full-scale centrifugal mill, by P. J. D. Lloyd, A. A. Bradley, A. L. Hinde, K. H. Stanton, and G. K. Schymura | 149 |
| STILFONTEIN Gold Mine | |
| The mining of low-grade areas at Stilfontein Gold Mine, by V. J. Solomon and H. P. Coetzee | 30 |
| Stönnner, H. -M. | |
| jt author: The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. -M. Stönnner and P. Wiesner | 97 |

| | Page |
|---|------|
| STRAINS and stresses | |
| Contribution to the mechanism of core discing, by T. R. Stacey | 269 |
| Strydom, N. B. | |
| jt author: The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom . . | 193 |
| disc.: Heat transfer and limiting physiological criteria as a basis for the setting of heat stress limits, by J. M. Stewart (published in the Journal v. 81 p. 239) | 145 |
| SUPPORTS - Design theory | |
| Support in shallow mines using horizontally reinforced systems, by J. A. Hahn, G. E. Blight, and L. Dison | 277 |
| T | |
| Taylor, J. L. | |
| jt author: The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor. | 177 |
| TEMPERATURE | |
| The prediction of air temperatures in intake haulages in mines, by K. R. Vost | 316 |
| TEMPERATURE - Physiological effect | |
| Heat transfer and limiting physiological criteria as a basis for the setting of heat stress limits, by J. M. Stewart (published in the Journal v. 81 p. 239) Disc | 145 |
| THABAZIMBI mine | |
| Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| TIN | |
| The gravity recovery of cassiterite, by L. M. Falcon | 112 |
| Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| Turner, P. S. | |
| author: An analogue system for the early detection of fires in gold mines | 1 |
| U | |
| UIS Tin Mine | |
| Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines, by H. C. Voges | 186 |
| URANIUM | |
| Calculations of grade and tonnage for two co-products from a projected South African gold mine, by E. J. Magri | 71 |
| The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | 177 |

| | Page |
|--|------|
| The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. -M. Stönnner and P. Wiesner | 97 |
| V | |
| van der Linde, A. | |
| jt author: The emission of mercury from gold-reduction works in South Africa, by H. H. E. Schröder, A. van der Linde, and N. B. Strydom . . | 193 |
| van der Spuy, R. C. M. | |
| author: The heavy-minerals plant at Palabora Mining Company - a low-grade, high-tonnage gravity concentrator | 17 |
| van Heerden, F. | |
| author: Project management on a reimbursable, plus-fee contract | 329 |
| van Rensburg, P. | |
| Proposer of vote of thanks to A. N. Brown for his Presidential Address | 242 |
| van Wyk, A. P. | |
| author: Kollig op oppervlaktebedekking van metaalonderdele | 168 |
| Viljoen, E. B. | |
| jt author: The design, commissioning, and performance of the NIMCIX section of the Chemwes uranium plant, by A. M. McIntosh, E. B. Viljoen, W. M. Craig, and J. L. Taylor | 177 |
| Visagie, S. | |
| author: Spotlight on coal-based direct reduction at Iscor | 165 |
| Voges, H. C. | |
| author: Heavy-medium and gravity separation at Iscor's tin-ore and iron-ore mines | 186 |
| Vost, K. R. | |
| author: The prediction of air temperatures in intake haulages in mines | 316 |
| W | |
| Wiesner, P. | |
| jt author: The design of equipment for a solvent-extraction plant for the recovery of metal salts, by H. -M. Stönnner and P. Wiesner | 97 |
| Y | |
| Young, G. L. C. | |
| Contribution: Reichert cones for Witwatersrand gold ores, by R. Guest | 233 |



